THE TOLERANCE OF MAN FOR HEXAVALENT URANIUM. PART II. THE EXCRETION OF URANYL NITRATE GIVEN INTRAVENOUSLY TO HUMAN SUBJECTS

Abstract

Tracer studies employing ~~an~~ enriched ~~mixture of~~ uranium in the isotopes ~~of~~ U^{234}, U^{235} have been carried out in six human subjects: four males and two females. The uranium was given intravenously in the hexavalent state as uranyl nitrate in amounts ranging from 6 micrograms to 70 micrograms per kilogram of body weight.

Each individual of the series received a single injection of the metal except for Subject #6 who was given two widely spaced doses. The first of these was when his condition was normal and the second after an acidosis had been produced by ingestion of ammonium chloride. Renal function tests including urinary catalase, protein, amino N to Cretainine N ratio, and clearances of mannitol and p - aminohippurate were done before and after administration of uranium. Only at the 70 microgram per kilogram level in Subject #6 was there a slight rise in urinary catalase and protein suggesting that tolerance had been reached. All other tests were negative.

*1 The excretion of uranium was mainly in the urine where from 70 to 85 per cent ~~appeared in twenty-four hours.~~ The production of an acidosis with ammonium chloride (Subject #6) decreased the rate of excretion.

~~Traces of uranium continued to be eliminated for at least two weeks after it had been administered. It is surmised that this represented metal retained in the bones.~~ Attempts at mobilization of the fraction retained by injection of citrate and by the use of a low calcium diet plus dihydrotochysterol were ineffective.